

March 26, 2001

MEMORANDUM

TO: Katherine B. Kelly, Administrator
Air Quality Division

FROM: Shawnee Yihong Chen, P.E., Air Quality Engineer
Process Engineering, Technical Services Office *SYC*

THROUGH: Daniel Salgado, Lead Process Engineering
Technical Services Office *[Signature]*

SUBJECT: **TECHNICAL ANALYSIS FOR TIER I OPERATING PERMIT**
9506-056-1, Crown Pacific Limited Partnership, Coeur d'Alene Operations
(Final Tier I Operating Permit No. 055-00007)

Permittee:	Crown Pacific Limited Partnership 200 South Huetter Road, P.O. Box 729 Coeur d'Alene, ID 83816
Permit Number:	055-00007
Standard Industrial Classification:	2421
Description:	Dimensional Lumber Production
Kind of Products:	Dimensional lumber, wood by-products
Responsible Official:	K. C. Hansen, Safety & Environmental Compliance
Person to Contact:	K. C. Hansen, Safety & Environmental Compliance
Telephone Number:	(208) 765-47167
# of Full-time Employees	100
Area of Operation:	80 acres
Facility Classification:	A
County:	Kootenai
Air Quality Control Region:	062
UTM Coordinates:	514.0, 5281.0
Exact Plant Location:	Range 4 West, Township 50 North, NW ¼ Section 9

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PUBLIC COMMENT / EPA REVIEW

A 30-day public comment period for the Crown Pacific Limited Partnership, Coeur d'Alene, proposed Tier I operating permit (OP) was held from March 8, 2000 to April 7, 2000 in accordance with IDAPA 58.01.01.364 (*Rules for the Control of Air Pollution in Idaho*). Written public comments were received during the public comment period.

After the public comment period, EPA was sent the proposed OP and the technical analysis memorandum for their 45-day review period. EPA had no objections with regard to the terms and conditions of the proposed permit.

LIST OF ACRONYMS

ACFM	Actual Cubic Feet Per Minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
dscf	Dry Standard Cubic Feet
EF	Emission Factor
EPA	United States Environmental Protection Agency
gpm	Gallons Per Minute
gr	Grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IC	Integrated Chip
IDAPA	Idaho Administrative Procedures Act
km	Kilometer
lb/hr	Pound Per Hour
MMBtu	Million British Thermal Units
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NSPS	New Source Performance Standards
O ₃	Ozone
PM	Particulate Matter
PM ₁₀	Particulate Matter with an Aerodynamic Diameter of 10 Micrometers or Less
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PTC	Permit To Construct
PTE	Potential To Emit
SCC	Source Classification Code
scf	Standard Cubic Feet
SO ₂	Sulfur Dioxide
TSP	Total Suspended Particulates
T/yr	Tons Per Year
μm	Micrometers
VE	Visible Emissions
VOC	Volatile Organic Compound

1. PURPOSE

The purpose of this memorandum is to set out the legal and factual basis for this final Tier I operating permit (OP) in accordance with IDAPA 58.01.01.362, *Rules for the Control of Air Pollution in Idaho (Rules)*.

The Idaho Department of Environmental Quality (DEQ) staff has reviewed the information provided by Crown Pacific Limited Partnership, Coeur d'Alene Operations (C-P, CDA) regarding the operation of its facility located in Coeur d'Alene, Idaho. This information was submitted on the requirements of the Tier I OP in accordance with IDAPA 58.01.01.300 of the *Rules*.

2. SUMMARY OF EVENTS

On June 5, 1995, DEQ received the Tier I OP application from C-P, CDA for their facility in Coeur d'Alene, Idaho. The application was determined to be administratively complete on August 4, 1995. On June 4, 1997, DEQ received revisions from C-P, CDA for their Tier I OP application. On December 4, 1998, DEQ received a Tier I OP application update from C-P, CDA. On February 25, 1999, DEQ received a certification for the December 4, 1998 submittal from C-P, CDA. On November 4, 1999, DEQ sent an issuance directive letter to C-P, CDA. On December 2, 1999, DEQ received a completely revised Tier I OP application from C-P, CDA. Since January, 2000, DEQ has received additional information from C-P, CDA through mail, fax and E-mail. The draft Tier I operating permit and technical memorandum underwent public comment from March 8, 2000 to April 7, 2000. Written public comments were received during the public comment period. The proposed permit was submitted to EPA for their 45-day review from November 13, 2000 to December 28, 2000. EPA had no objections with regard to the terms and conditions of the proposed permit.

3. BASIS OF THE ANALYSIS

The following documents were relied upon in preparing this memorandum and the Tier I OP:

- Tier I Air Operating Permit Application, (December 2, 1999 submittal; December 4, 1998 submittal; June 4, 1997 submittal; June 5, 1995 submittal; additional information through mail, fax, and E-mail from C-P, CDA);
- Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, January 1995, Office of Air Quality Planning and Standards, United States Environmental Protection Agency;
- 40 CFR Part 70;
- IDAPA 58.01.01 Air Rules;
- Guidance developed by EPA and DEQ;
- 40 CFR Part 60;
- Documents and procedures developed in the Title V Pilot Operating Permit program;
- Information in DEQ's source file;
- C. David Cooper, "Air Pollution Control, A Design Approach", Waveland Press, Inc. 1986;
- John Richards, "Control of Particulate Emissions", Air Pollution Technology Institute Course 413, 1995; and

- "Combustion Evaluation in Air Pollution Control", EPA APTI course 427, Draft Revision, March, 1994

4. REGULATORY ANALYSIS – GENERAL FACILITY

4.1 FACILITY DESCRIPTION

4.1.1 General Process Description

The following process description is taken from C-P, CDA's revised Tier I application (November 30, 1999). It can be found in the Public Comment Package.

The C-P, CDA operates a lumber mill that includes a sawmill, drying kilns, a planer mill, and associated equipment used to process raw logs into dried dimensional lumber. A steam plant consisting of one natural gas-fired boiler and one wood-fired boiler provides steam to the facility. The boilers and wood drying kilns generally operate 24 hours per day, 7 days per week, 52 weeks per year. The sawmill, planing, and material handling facilities can potentially operate 24 hours (3 shifts) per day, 7 days per week, 52 weeks per year. The mill can process up to 200,000 million board feet annually.

Logs are delivered to the mill both by raft and truck. Rafted logs are transported to the facility via the Spokane River and are stored in the river until processed. Logs trucked into the facility are stored in the river until processed. Logs enter the log infeed from the river. From the infeed, they are transported by loaders to the debarking area, where the bark is peeled from the logs by the debarkers.

Bark from the debarker is processed through a hog where it is shredded and then pneumatically conveyed through a cyclone to the fuel bin and then through a second cyclone to the hog fuel boiler. Bark can also be pneumatically conveyed through a target box and into a storage bin. From the storage bin, the hog fuel can be sold or transferred to another cyclone and stored on the ground for later use in the boiler.

Debarked logs enter the sawmill where they are cut into dimensional lumber. The edge waste from the logs is processed through a chipper and passed through a screen. Material from the cutting chipper is separated. All chips are transferred pneumatically to a target box and into a double storage bin until sold. Fines that pass through the screen are combined with the sawmill sawdust and conveyed through a target box into a storage bin and sold.

Lumber is sorted, stacked, and then dried in steam-heated dry kilns. Each kiln has numerous roof vents from which hot air is exhausted to maintain a specified temperature within each kiln. Particulate and naturally occurring VOCs from the wood are the only pollutants exiting the kilns. On occasion, lumber is sorted by hand and dried outdoors.

The planer mill receives dried lumber from the kilns. The planing mill consists of a screen, planer fines chipper, planer chips chipper, and a hog. The lumber is planed and trimmed to proper dimensional size. Trimmed ends are chipped and transferred pneumatically through a target box and into a chip bin to be sold. Any pieces too large for the screen are sent to the hog. Hogged waste from the planer hog is conveyed directly to the fuel bin.

Shavings generated through the planer process passes through one of four cyclones at the planer building. Emissions from the largest cyclone are controlled by a baghouse. Shavings are pneumatically conveyed to either the hog fuel bin or the shavings bin cyclone.

The finished dimensional lumber is sorted, graded, stacked, wrapped, and stored until it can be shipped out by truck or rail car.

4.1.2 Facility Classification

This facility is a sawmill and planing facility. The Standard Industrial Classification (SIC) is 2421. This is a major facility in accordance with IDAPA 58.01.01.008.10(c) (*Rules*). It emits or has the potential to emit one hundred (100) T/yr, or more, of CO, NO_x, and VOC, respectively, per the application. The detailed calculation can be found at the end of sections 2, 3, 7, & 8 of 12/02/99's Tier I application in the Public Comment Package. The facility is not a designated facility as defined in IDAPA 58.01.01.006.27.

4.1.3 Area Classification

C-P, CDA is located near Coeur d'Alene, Idaho, approximately three miles west of town, along the Spokane River, in Kootenai County. Per 40 CFR 81.313 (July 1, 1999 version), Kootenai County is unclassifiable for SO₂, CO, PM₁₀, and NO_x; the one-hour O₃ standard is not applicable in Kootenai county. C-P, CDA is located in AQCR 62 and UTM Zone 11.

4.1.4 Permitting History

11/17/80 - 11/16/85	Operating Permit No. 13-0680-0007 (Note: a hog fuel boiler with breaching and stack, log yard, mill roads, parking areas, loading and unloading areas)
10/05/1994	Letter of exemption of 25.1 MMBtu/hr Natural Gas-Fired Boiler. The letter also stated that the addition of the baghouse downstream from the planer shavings cyclone did not constitute modification.
09/29/1999	DEQ Letter: lumber production increasing from 124 million board feet per year (MMbdf/yr) to 200 MMbdf/yr was not a modification and therefore, didn't require a permit to construct (PTC).
12/22/1999	PTC No. 055-00007: New Lumber Kiln Installation.
02/25/2000	Amended PTC No. 055-00007: New Lumber Kiln Installation, which supersedes the 12/22/1999 edit.

The Wyatt & Kipper hog fuel boiler and the original 10 single track, steam-heated lumber dry kilns were constructed prior to 1970, per applicant's information provided through a 02/09/2000 E-mail, which can be found in the Public Comment Package. An operating permit issued on 11/17/1980 covers a hog fuel boiler with breaching and stack, log yard, mill roads, parking areas, and loading and unloading areas. A facility-wide ambient air quality impact analysis was conducted by C-P, CDA on September 13, 1999 while the facility requested to increase its allowable product throughput to the estimated maximum design capacity (800,000 tons logs/yr).

4.2 FACILITY-WIDE APPLICABLE REQUIREMENTS

Unless specified, the following requirements apply to all emissions units at the facility. The authorities of each Permit Condition are cited in the permit.

4.2.1 Permit Requirement - Fugitive Particulate Matter - [IDAPA 58.01.01.650-651 (5/1/94)]

4.2.1.1 Applicable Requirement

See Permit Condition 1.1.

4.2.1.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 1.2, 1.3, and 1.4. The quarterly facility-wide inspection is sufficient. The main fugitive emissions sources are required to be inspected monthly under Permit Condition 5.2.

Facility-wide Condition 1.2 states that the permittee is required to monitor and record the frequency and the methods used by the facility to reasonably control fugitive particulate emissions. IDAPA 58.01.01.651 gives some examples of ways to reasonably control fugitive emissions, which includes use of water or chemicals, application of dust suppressants, use of control equipment, covering of trucks, paving of roads or parking areas, and removal of materials from streets.

Facility-wide Condition 1.3 requires that the permittee maintain records of all fugitive dust complaints received. In addition, the permittee is required to take appropriate corrective action as expeditiously as practicable after a valid complaint is received. The permittee is also required to maintain records which shall include the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

To ensure that the methods being used by the permittee to reasonably control fugitive particulate matter emissions whether or not a complaint is received, Facility-wide Condition 1.4 requires that the permittee conduct periodic inspections of the facility. The permittee is required to inspect potential sources of fugitive emissions during daylight hours and under normal operating conditions. If the permittee determines that the fugitive emissions are not being reasonably controlled the permittee shall take corrective action as expeditiously as practicable. The permittee is also required to maintain a log of the results of each fugitive emissions inspection.

Both Facility-wide Conditions 1.3 and 1.4 require the permittee to take corrective action as expeditiously as practicable. In general, the Department believes that taking corrective action within twenty-four hours of receiving a valid complaint or determining that fugitive particulate emissions are not being reasonably controlled meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

4.2.2 Permit Requirement - Odorous Gas, Liquids, or Solids - [IDAPA 58.01.01.775-776 (5/1/94)]

4.2.2.1 Applicable Requirement

Facility-wide Condition 1.5 and IDAPA 58.01.01.776 both state that: "*No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids to the atmosphere in such quantities as to cause air pollution.*" This condition is currently considered federally enforceable until such time it is removed from the SIP, at which time it will be a state-only enforceable requirement.

4.2.2.2 Monitoring, Recordkeeping, and Reporting

Facility-wide Condition 1.6 requires the permittee to maintain records of all odor complaints received. If the complaint has merit, the permittee is required to take appropriate corrective action as expeditiously as practicable. The record is required to contain the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

Facility-wide Condition 1.6 requires the permittee to take corrective action as expeditiously as practicable. In general, the Department believes that taking corrective action within twenty-four hours of receiving a valid odor complaint meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

4.2.3 Permit Requirement - Visible Emissions - [IDAPA 58.01.01.625 (4/23/99, T)]

4.2.3.1 Applicable Requirement

See Permit Condition 1.7.

IDAPA 58.01.01.625 and Facility-wide Condition 1.7 state that "*(No) person shall discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period which is greater than twenty percent (20%) opacity as*

determined . . .” by IDAPA 58.01.01.625. This provision does not apply when the presence of uncombined water, nitrogen oxides, and/or chlorine gas are the only reason(s) for the failure of the emissions to comply with the requirements of this rule.

4.2.3.2 Monitoring, Recordkeeping, and Reporting

To ensure reasonable compliance with the visible emissions rule, Facility-wide Condition 1.8 requires that the permittee conduct routine visible emissions inspections of the facility. The permittee is required to inspect potential sources of visible emissions, during daylight hours and under normal operating conditions. If any visible emissions are present from any point of emission covered by this section, the permittee must take appropriate corrective action as expeditiously as practicable. If opacity is determined to be greater than twenty percent (20%) for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period, the permittee must take corrective action and report the exceedance in its annual compliance certification and in accordance with the excess emissions rules in IDAPA 58.01.01.130-136. The permittee is also required to maintain records of the results of each visible emissions inspection which must include the date of each inspection and a description of the permittee's assessment of the conditions existing at the time visible emissions are present, any corrective action taken in response to the visible emissions, and the date corrective action was taken.

It should be noted that if a specific emissions unit has a specific compliance demonstration method for visible emissions that differs from Facility-wide Condition 1.8, then the specific compliance demonstration method overrides the requirement of Condition 1.8. Condition 1.8 is intended for small sources that would generally not have any visible emissions.

Facility-wide Condition 1.8 requires the permittee to take corrective action as expeditiously as practicable. In general, the Department believes that taking corrective action within twenty-four hours of discovering visible emissions meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

4.2.4 Permit Requirement -Startup, Shutdown, Scheduled Maintenance, Safety Measures, Upset and Breakdown - [IDAPA 58.01.01.130 (11/13/98, T)]

4.2.4.1 Applicable Requirement

Facility-wide Condition 1.9 requires that the permittee comply with the requirements of IDAPA 58.01.01.130-136 for startup, shutdown, scheduled maintenance, safety measures, upset and breakdowns. This section is fairly self-explanatory and no additional detail is necessary in this technical analysis. It should, however, be noted that subsections 133.02, 133.03, 134.04, and 134.05 are not specifically included in the permit as applicable requirements. These provisions of the *Rules* only apply if the permittee anticipates requesting consideration under subsection 131.02 of the *Rules* to allow the Department to determine if an enforcement action to impose penalties is warranted. Section 131.01 states “. . . The owner or operator of a facility or emissions unit generating excess emissions shall comply with Sections 131, 132, 133.01, 134.01, 134.02, 134.03, 135, and 136, as applicable. If the owner or operator anticipates requesting consideration under Subsection 131.02, then the owner or operator shall also comply with the applicable provisions of Subsections 133.02, 133.03, 134.04, and 134.05.” Failure to prepare or file procedures pursuant to Sections 133.02 and 134.04 is not a violation of the *Rules* in and of itself, as stated in subsections 133.03.a and 134.06.b. Therefore, since the permittee has the option of following the procedures in Subsections 133.02, 133.03, 134.04, and 134.05; and is not compelled to, the subsections are not considered applicable requirements for the purpose of this permit and are not included as such.

4.2.4.2 Monitoring, Recordkeeping, and Reporting

The compliance demonstration is contained within the text of Facility-wide Condition 1.9. No further clarification is necessary here.

4.2.5 Permit Requirement - Open Burning - [IDAPA 58.01.01.600-616 (5/1/94)]

See Permit Condition 1.12.

4.2.6 Permit Requirement - Asbestos - [40 CFR 61 Subpart M]

See Permit Condition 1.13.

4.2.7 Permit Requirement - Chemical Accident Prevention Provisions - [40 CFR 68]

4.2.7.1 Requirement

This facility is not currently subject to the requirements of 40 CFR Part 68 based on the information provided by the permittee through 02/09/2000's E-mail stated that *"This facility does not currently have a threshold quantity of any regulated substance as listed in 40 CFR 68.130"*. However, should the facility ever become subject to the requirements of 40 CFR Part 68 then it must comply with the provisions contained in 40 CFR Part 68 by the time listed under Permit Condition 1.14.

4.2.8 Testing Method

See Permit Conditions 1.15 and 1.16, which apply to the emissions units in this permit when a source test is required. More discussion can be found under Section 5.1 - Wyatt & Kipper Hog Fuel Boiler.

The performance test protocol is required to address the required averaging period specified in IDAPA 58.01.01.679; and the altitude correction in IDAPA 58.01.01.680 for the performance test.

4.2.9 Permit Requirement - Sulfur Content of Distillate Oil - [IDAPA 58.01.01.728 (5/1/94)]

4.2.9.1 Requirement

See Permit Condition 1.17

4.2.9.2 Monitoring, Recordkeeping, and Reporting

See Permit Condition 1.18.

4.2.10 Permit Requirement - Document Certification - [PTC 055-00007, 2/25/2000]

See Permit Condition 1.19

4.3 HAPS

The hazardous air pollutants (HAPs) emitted from the facility are from the two boilers in the form of organic and inorganic compounds; the emissions total about 0.2 T/yr, per the application.

4.4 ALTERNATIVE OPERATING SCENARIOS

No alternative operating scenarios have been requested by the applicant.

4.5 TRADING SCENARIOS

The permittee has not requested to trade any emissions.

4.6 EXCESS EMISSIONS

The facility does not foresee any excess emissions in its submittal dated 01/04/2000. It can be found in the Public Comment Package.

5. REGULATORY ANALYSIS - EMISSIONS UNITS

5.1 WYATT & KIPPER HOG FUEL BOILER

5.1.1 Emissions Unit Description

The Wyatt & Kipper hog fuel boiler, installed in 1970, is a hog fuel spreader stoker boiler, rated at 60,000 lb steam/hr, per the application.

The boiler is fired with a mixture of hog fuel and shavings that typically have an average higher heating value (HHV) of 12.36 MMBtu/ton. The boiler operates 24 hours a day, 7 days a week and 52 weeks a year. The boiler is equipped with a multi-cyclone as its primary control equipment. In 1992, an electrostatic precipitator (ESP) was installed as secondary control equipment to control emissions from multi-cyclone. The facility also operates an opacity continuous emissions monitoring (OCEM) unit on this boiler stack (see Section 5.1.2.2.3 for details).

The stack parameters for the boiler are as follows:

- Stack exit height from ground level 40 feet
- Stack exit diameter 3.83 feet
- Stack exit gas flow rate, typical 14,120 scfm
- Stack exit temperature, typical 485 °F

The Wyatt & Kipper hog fuel boiler was source tested for particulate emissions on November 16-17, 1992. The source test report can be found at Section 10 of 12/02/1999's Tier I application in the Public Comment Package.

A most recent source test was conducted on 6/20/00. The summary of testing can be found in Appendix A of this memo. Some discussions can be found in Section 5.1.2.2.

5.1.2 Permit Requirement - Grain-Loading Standard - [IDAPA 58.01.01.677 (5/1/94)]

5.1.2.1 Applicability

See Permit Condition 2.1.

5.1.2.2 Monitoring, Recordkeeping, and Reporting

5.1.2.2.1 Source Test

See Permit Conditions 2.3, 2.4, 2.12, 2.13, & 2.14

Rolling three-hour averaging time period for calculating average steaming rate may be reasonable, as source test data is obtained through three one-hour test runs. See Permit Condition 2.3.

The Wyatt & Kipper hog fuel boiler was source tested for particulate emissions on November 16-17, 1992 after the ESP was installed. The source test result was reviewed by EPA. It was stated in the reviewing letter that *"While DAW's boiler is rated at 50,000 pph [pounds per hour], an operating permit could restrict it to the 36,700 pph observed during the test".*

C-P, CDA conducted a source test on 6/20/00. The emissions, including back-half was 0.0376 gr/dscf @ 8% of O₂ at average steaming rate of 50,265 lb steam/hr.

See Permit Condition 2.13. Several parameters are required to be recorded during the source test. The permittee is required to establish and submit baseline values for operating conditions, and parameters listed under Permit Condition 2.13. Also see Section 5.1.2.2.2(d) of this technical memorandum.

5.1.2.2.2 Monitoring and Recording Parameters

See Permit Conditions 2.5, 2.6, 2.7, 2.8, & 2.13.

The permittee is required to monitor the following parameters. Baseline values for these parameters will be established by the permittee based on the source test and manufacturer's recommendation. Within sixty (60) days of the issuance of this permit, the permittee is required to develop an O&M manual (see Permit Conditions 2.13 and 2.11). Operating within the range developed under Permit Condition 2.11 will ensure the continuous compliance of the grain-loading standard.

- a) Steam production rate: see Permit Conditions 2.5 and 2.6.
- b) Hog fuel analysis: see Permit Condition 2.6. There is a correlation between steam production rate and hog fuel usage, but the variation of hog fuel, such as different wood species, different combinations of hog fuel, and different conditions of hog fuel (i.e., freezing hog fuel in the winter), varies this correlation. To generate the same amount of steam would require more hog fuel input if the heating value of the hog fuel is low, but less hog fuel input if the heating value of the hog fuel is high. The more hog fuel input, the more PM emissions. Therefore, monitoring steaming rate may not be adequate to ensure compliance with grain-loading standard. Permit Condition 2.6 requires the permittee to monitor the quality of hog fuel in addition to steaming rate monitoring. Based on temperature data from 1961 to 1990 provided by Idaho State Climate Services, from November to March, the minimum temperatures are below 32°F. The freezing hog fuel has lower heating value. Therefore frequency of monthly sampling is required for those months. For monthly fuel analyses, they shall be at least twenty(20) days apart. If the sampled heating value is less than that of the hog fuel used during the most recent source test under Permit Condition 2.12, or 2.4, which demonstrates compliance with Permit Conditions 2.1 and 2.2, the adjusted maximum allowable steaming rate shall not exceed the steaming rate calculated in accordance with the following equation.

$$\text{Fuel-adjusted maximum steaming rate} = \text{average steaming rate during test} * 0.85 * \frac{(\text{sampld heating value})}{(\text{fuel heating value during test})}$$

Comparing either gross heating value (HHV) with that of hog fuel used during source test, or low heating value (LHV) with that of hog fuel used during source tests is fine.

Hog fuel with high moisture content, consequently with low heating value, reduces the combustion efficiency of the boiler by 5% to 15%, per the information provided from "Combustion Evaluation in Air Pollution Control", EPA APTI course 427, Draft Revision, March, 1994, p.221. The previously mentioned fuel-adjusted steaming rate equation has taken this into account. As the 6/20/00's source test indicates that the emissions concentration from this unit is less than 20% of its grain-loading standard which is 0.2 gr/dscf. Staff believes that the above fuel-adjusted maximum steaming rate is reasonable.

- c) Pressure drop across multi-clone: see Permit Condition 2.7. Pressure drop is an indicator for multi clone performance. When it deviates too much from the baseline value or manufacturer's recommendation range, it may indicate performance problems, such as a plug, bypass, etc. There is a need to monitor this parameter. More frequently pressure drop recording may provide the permittee the quick feed back on multi-cyclone operation status. Permit Condition 2.7 requires weekly record.

Applying Brenoulli equation, the pressure drop across the multi clone is proportional to the square of the gas flow rate. Assuming the flue gas flow rate is proportional to the steaming rate, the pressure drop varies proportional to the square of the steaming rate. Therefore, setting an operating range as baseline pressure drop $\pm 20\%$ may be not suitable here. Permit Condition 2.11 outlines the procedure to develop an operating range for the pressure drop.

- d) ESP operating parameters: see Permit Condition 2.8. These parameters are required to be monitored to ensure the appropriate operation of ESP. In addition, Permit Condition 2.11 provides procedures to develop operating ranges for these parameters.

Due to the change of monitoring requirements as discussed in Section 5.1.2.2.3 of this memo, C-P, CDA didn't obtain the baseline data for secondary voltage and current, and spark rate for the ESP during 6/20/00's source test. The emissions concentration from the test was less than 20% of the standard. In order to satisfy Permit Condition 2.11 regarding O&M manual, C-P, CDA may obtain operational ranges for these parameters from the manufacturer and combine with their operation experience for the ESP, and then verify and update these ranges by conducting a source test as required under Permit Condition 2.12 within the first three (3) years of this permit term.

5.1.2.2.3 Removing Opacity Continuous Emissions Monitoring System (OCES) and adding additional parameters for opacity and grain-loading monitoring (2.9)

EPA has decided to allow C-P, CDA to remove their OCES with the following conditions: monitoring primary voltage and current, secondary voltage and current, and spark rate for the ESP; and conducting monthly visible emissions monitoring. EPA's letter can be found in Appendix D of this memo.

The proposed OP has addressed this change. The affected permit conditions are 2.8, 2.9, 2.11, 2.12, and 2.13.

5.1.2.2.4 Reporting

Reporting requirements can be found under facility-wide conditions and general provisions of the permit.

5.1.3 Permit Requirement - Visible Emissions/Opacity - IDAPA 58.01.01.625 (4/23/99.T)

5.1.3.1 Applicability

See Permit Condition 2.2

5.1.3.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 2.9, 2.10, & 2.11; and Section 5.1.2.2.3 of this memorandum.

5.1.4 Permit Requirement - Steam Production Rate - IDAPA 58.01.01.322.01 (3/19/99)]

5.1.4.1 Applicability

See Permit Condition 2.3. The operational steam rate limit established by a source test required under Permit Conditions 2.4, or 2.12 is to be used to ensure continuous compliance with the grain-loading standard. The permittee can conduct another source test to demonstrate compliance at the higher steam production rate.

5.1.4.2 Monitoring, Recordkeeping, and Reporting

See Permit Condition 2.4.

5.1.4.3 Non-Applicability Determination - 40 CFR 60 Subpart Dc & Db

Per the information provided in the application and in 6/20/00's source test report, the boiler is not subject to 40 CFR 60 Subpart Dc & Dc as it was installed in the 1970 and the boilers heat input capacity is less than 100 million Btu per hour.

5.2 **NATURAL GAS BOILER**

The natural gas boiler was installed in 1995 with a design capacity of 25.1 million Btu per hour (MMBtu/hr). It was exempted from the PTC requirements. The steam generated by this boiler is used for process (i.e. lumber drying kilns).

5.2.1 Permit Requirement - Visible Emissions - [IDAPA 58.01.01.625 (4/23/99, T)]

5.2.1.1 Applicable Requirement

See Permit Condition 3.1 (1.7).

5.2.1.2 Monitoring, Recordkeeping, and Reporting

5.2.1.2.1 Monitoring

Natural gas is considered a "clean" fuel with respect to particulate matter emissions. The preamble to the 40 CFR 60, Subpart Dc regulations at 54 FR 24792, stated: *"The uncontrolled PM emissions from the combustion of natural gas in small steam generating units are very low. Uncontrolled PM emissions levels of less than 9 ng/J (0.02 lb/million Btu) heat input are typical of natural gas-fired steam Generating units. Because of these low uncontrolled PM emissions levels, the application of any type of PM control technology to small natural gas-fired steam Generating units would impose significant costs for no benefit. Consequently, the use of any conventional PM control technology to reduce PM emissions from small natural gas-fired steam Generating units is considered unreasonable and no further consideration has been given to the development of standards to limit PM emissions from these units."* DEQ staff does not foresee that normal operations of natural gas combustion will cause a violation of the twenty percent (20%) opacity standard. Monthly visible emissions inspection as required by Permit Condition 1.8, limit on the fuel type as required by Permit Condition 3.4, and fuel usage and type recording as required by Permit Condition 3.5 are sufficient to ensure the permittee is in compliance with Permit Condition 3.1 (1.7).

Under the authority of IDAPA 58.01.01.322.01 (*Rules*), the records of fuel type are required in Permit Condition 3.5.

5.2.1.2.2 Reporting

The permittee shall remain in compliance with reporting requirements under Facility-wide Conditions and General Provisions of the permit.

5.2.2 Permit Requirement – Fuel-Burning Equipment - Particulate Matter - [IDAPA 58.01.01.675 (11/13/98, T)]

5.2.2.1 Applicable Requirement

See Permit Condition 3.3.

5.2.2.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 3.4 & 3.5; and Section 5.2.1.2 of this memorandum. The following calculation demonstrates that Permit Conditions 3.4 & 3.5 are sufficient to assure compliance.

It is proposed that compliance with the particulate matter standard be assumed, provided that only natural gas is combusted. According to AP-42, Section 1.4, approximately 7.6 pounds of particulate is generated per million cubic feet (lb/10⁶ scf) of natural gas combusted in 10 - 100 MMBtu/hr boilers. Also, according to 40 CFR 60, Appendix A, Method 19, approximately 8,710 dry standard cubic feet (dscf) of flue gas at standard conditions (68°F, 29.92 in. Hg) is created per million Btu of natural gas.

This data is used in the following steps to demonstrate that particulate emissions from the combustion of natural gas will always be less than the particulate matter standard of 0.015 gr/dscf.

- 1) Correct the flue gas volume -

For an altitude of 2134 feet (per IDAPA 58.01.01.680):
subtract $0.10 \times 21.34 = 2.134$ in. Hg from standard atmospheric pressure at sea level
 $29.92 \text{ in. Hg} - 2.134 \text{ in. Hg} = 27.79 \text{ in. Hg}$
using the Ideal Gas Law and knowing that n, R, and T will be the same,

$$V_2 = \frac{P_1 V_1}{P_2} \quad (5.1)$$

where,

V_2 = the gas volume corrected for altitude,
 V_1 = the known gas volume (8710 dscf),
 P_1 = the pressure of the known gas volume (29.92 in. Hg),
 P_2 = the pressure of the corrected gas volume (27.79 in.Hg).

The altitude corrected volume (V_2) of the flue gas is 9,378 dscf.

For 3% oxygen:

using a standard correction ratio as presented in 40 CFR 60, Appendix A, Method 19,

$$F_2 = F_1 \times \frac{20.9}{0.9 - 3.0} \quad (5.2)$$

where,

F_2 = the gas volume corrected to 3% oxygen,
 F_1 = the altitude corrected flue gas volume (9,378 dscf) as calculated in Equation (5.1).
The oxygen and altitude corrected volume (F_2) of the flue gas is 10,950 dscf per million Btu of natural gas.

- 2) Determine the volume of flue gas created by the combustion of one million cubic feet of natural gas:

$$10^6 \text{ ft}^3 \times 1,050 \text{ Btu/ft}^3 \times 10,950 \text{ dscf}/10^6 \text{ Btu} = 11.5 \times 10^6 \text{ dscf} \quad (5.3)$$

- 3) Determine the grain loading per cubic foot of flue gas:

$$7.6 \text{ lb PM} \times 7,000 \text{ gr/lb} \times 1/11.5 \times 10^6 \text{ dscf} = 0.005 \text{ gr/dscf} < 0.015 \text{ gr/dscf} \quad (5.4)$$

Emissions factors given in AP-42 are generally accepted as conservative estimates. Even a conservative estimate of emissions from natural gas combustion results in an approximated grain loading well below the standard of 0.015 gr/dscf. Therefore, as long as the permittee is in compliance with Permit Conditions 3.4 & 3.5, the permittee is in compliance with the grain-loading standard.

The permittee shall remain in compliance with reporting requirements under Facility-wide Conditions and General Provisions of the permit.

5.2.3 Non-Applicability Determination - 40 CFR 60 Subpart Dc

Per the information provided by the applicant dated 4/6/00, the boiler is not subject to 40 CFR 60 Subpart Dc as it was first installed in the 1970s and purchased as a used one by C-P, CDA in 1990s. The information can be found in the proposed permit package. All requirements from 40 CFR 60 are removed from the OP and corresponding discussions are removed from the technical memorandum.

5.3 LUMBER DRYING KILNS

5.3.1 Emissions Unit Description

The eleven (11) lumber drying kilns have a total maximum capacity of drying 200 million board feet of lumber per year (MMbdf/yr), including the new drying kiln. They are steam-heated. Each kiln has system controlled multiple roof vents with trap doors. There is no control equipment installed to control the emissions from the vents. Once the new kiln was installed, it became part of the dry kiln emissions unit.

The ten (10) original kilns were installed prior to 1970, per the applicant's information provided in its 02/09/2000 E-mail. The 11th kiln was built in 1999 and it was permitted under PTC #055-00007. All requirements under PTC 055-00007, 2/25/2000, are incorporated into the operating permit. The PTC permit and its technical memo can be found in the Public Comment Package.

5.3.2 Permit Requirement - Visible Emissions/Opacity - IDAPA 58.01.01.625 (4/23/99.T)]

5.3.2.1 Applicability

See Permit Condition 4.1

5.3.2.2 Monitoring, Recordkeeping, and Reporting

See Permit Condition 4.2.

A typical dry kiln has many vents, maybe up to 10 or so each. Normally it is not possible to conduct a proper VE on a good number of these vents just because of the location of the individual vent. Opacity in general is not a problem from a dry kiln. During the winter cool months all you see is steam; during the warmer months, you do not see as much steam but still no opacity. Per comment from the public, a procedure to establish a baseline data is added to Permit Condition 4.2.

5.3.3 Permit Requirement - Process Weight Limit - [IDAPA 58.01.01.701]

5.3.3.1 Applicability

See Permit Condition 4.3. The ten (10) original kilns were installed prior to 1970, per applicant's information provided in its comments on the first draft technical memo through the 02/09/2000 E-mail. The new kiln was added to the drying building in 1999. As the applicant indicated, it was not practical to separate drying kilns and they need to be treated as one emissions unit. It is decided that IDAPA 58.01.01.701 is used to calculate the process weight limit.

5.3.3.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 4.4 & 4.5. Based on the applicant's 01/07/2000 submittal, the average emissions (lb/hr) are about 44% of allowable emissions limits. The calculation can be found in Appendix B of this memo. Therefore, the facility will be in compliance with process weight rules so long as the annual throughput of lumber drying kilns does not exceed their permitted limit, 200 million board feet per year on a rolling 12-month average.

The process rate used to calculate allowable emissions limits in accordance with IDAPA58.01.01.700 can be calculated using the following equation:

Process rate (lb/hr) = Throughput rate (mbdft/hr) * (F₁, S.W.E ft³/mbdft) * (D_w lb/ft³ S.W.E)

Conversion factor (F₁) and wood density can be found in Appendix C of this memo. Other EPA-approved, or DEQ-approved alternatives can be used as well.

5.3.4 Permit Requirement - VOC Emissions Limit- [PTC 055-00007 (2/25/2000) Section 1.1 of New Lumber Drying Kiln]

4.3.4.1 Applicability

See Permit Condition 4.6. This requirement is taken from PTC 055-00007 Section 1.1 of New Lumber Drying Kiln, issued in 2/25/2000. The PTC and the memo can be found in the Public Comment Package.

5.3.4.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 4.4 & 4.5. These requirements are taken from PTC 055-00007 Sections 2.1 and 3.1 of New Lumber Drying Kiln, issued on 2/25/2000.

Permit Condition 4.4 requires the permittee to monitor annual throughput. Limiting the throughput to less than 200 million board feet per year will inherently limit the VOC emissions to less than 150 T/yr.

5.3.5 Non-Applicability Determination - Process Equipment Emissions Limitation-[IDAPA 58.01.01.710]

Lumber drying kiln is not subject to this requirement as there is no steady air flow through the vents.

5.2 WOOD MATERIAL HANDLING AND MISCELLANEOUS SOURCES - TARGET BOXES, CYCLONES, ROSS/COASTAL BAGHOUSE, PLANER SHAVINGS BAGHOUSE, TRUCK BINS LOADOUT, DEBARKING, BARK HOG, AND HOGGED BARK CONVEYING

5.2.1 Emissions Unit Description

There are three target boxes. Material is transferred to each target box via a pneumatic conveyor. There is a total of eight cyclones. The emissions from Planer Shavings Cyclone are further controlled by the planer shavings baghouse. There are three truck bins. Each of the bins is a double bin with a total storage capacity of 45 units. The name, the throughput, and the type of material in this equipment can be found in the following table. The configuration and/or location of this equipment is shown the plant flow diagram, Figure 3 of the 12/02/1999 application. It can be found in the public comment package.

- see table on next page -

Target Boxes		Material	Maximum (Potential) Throughput (T/yr)
Hogged fuel sales bin target box		bark	56,680
Sawdust bin target box		sawdust	47,040
Chip bin target box		green chip	114,000
		planer chip	24,000
Cyclone and the Baghouse		Material	Maximum (Potential) Throughput (T/yr)
Boiler fuel storage cyclone		bark	56,680
Backup fuel storage pile cyclone		hogged fuel	8,000
Boiler feed cyclone		fuel	56,680
Pattern Shavings cyclone		shavings	10,000
Chipper fines cyclone		shavings	10,000
Trimmer sawdust cyclone		shavings	10,000
Planer shavings cyclone baghouse		shavings	33,600
Shavings bin cyclone		shavings	33,600
Truck bins load out		Material	Maximum (Potential) Throughput (T/yr)
Hogged bark truck bin loadout		bark	56,680
Sawdust bin truck loadout		sawdust	47,040
Chip loadout	sawmill chip	sawmill chip	144,000
	planer chip	planer chip	24,000

5.4.2 Permit Requirement - Fugitive Dust - [IDAPA 58.01.01.650-651 (5/1/94)]

5.4.2.1 Applicable Requirement

See Permit Condition 5.1 The emissions from target boxes, truck bins loadout, debarking, bark hog, and hogged bark conveying are fugitive emissions. These emissions units are subject to (*Rules*) on reasonable fugitive control.

5.4.2.2 Monitoring, Recordkeeping, and Reporting

See Permit Condition 5.2. The permittee shall remain in compliance with reporting requirements under the Facility-wide Conditions and General Provisions of the permit.

5.4.3 Permit Requirement - Visible Emissions/Opacity - [IDAPA 58.01.01.625 (4/23/99.T)]

5.4.3.1 Applicability

See Permit Condition 5.3. The cyclones and planer shavings cyclone baghouse are subject to this requirement.

5.4.3.2 Monitoring, Recordkeeping, and Reporting

See Permit Conditions 5.4 and 5.5. The monthly visible emissions inspection is required in the permit. A tier approach is used to establish a baseline for these emissions points. As visible emissions from the cyclones or baghouse usually indicate a problem, a monthly visible emissions inspection can prevent the permittee from a more serious problem and/or potential opacity violation. The cyclones are process equipment used to separate wood from the air stream. The Planer shavings cyclone baghouse is a control device, as it is used to control the emissions from the planer shavings cyclone. Due to the specific design of the baghouse, practically, the pressure drop of the baghouse cannot be measured. However, the permittee is required to operate the baghouse in accordance with O&M manual. See Permit Condition 5.5.

Based on a conversation with our inspector, as a rule of thumb, a minimum of ten (10) minutes of observation is needed to determine if there are any visible emissions from the emissions point(s).

The 02/09/2000 E-mail from the facility states that "The planer shavings baghouse is an old unit that was originally field-erected. Manufacturer's information is not available for this equipment."

5.4.4 Permit Requirement - Process Weight Limit-[IDAPA 58.01.01.701]

5.4.4.1 Applicability

See Permit Condition 5.6. All emissions units, except hogged bark conveying, are subject to this requirement.

5.4.4.2 Monitoring, Recordkeeping, and Reporting

There are no monitoring requirements for target boxes, cyclones, and the baghouse under this section. The calculations show that the emissions for each of these sources are less than 15% of their allowable emissions limits. The calculation can be found in Appendix B of this memorandum.

There are no monitoring requirements for truck bin loadout. The related calculations on truck bin loadout can be found in Appendix B of this memorandum. The calculations show that the emissions using C-P, CDA's EFs for each of these sources are less than 15% of their allowable emissions limits, and less than PW emissions limits, using adjusted AP-42 EFs.

5.4.5 Permit Requirement - Process Equipment Emissions Limitation-[IDAPA 58.01.01.710]

5.4.5.1 Applicability

See Permit Condition 5.7 and 5.8. This is a state-only permit requirement. It will become federally enforceable when approved by EPA as part of Idaho SIP.

Sawdust bin target box, sawmill chip bin target box, and pattern shavings cyclone qualify as De minimis exceptions under IDAPA 58.01.01.710.02.

Truck bin loadout doesn't subject to this requirement.

The emissions concentrations and emissions levels from planer chip bin target boxes, cyclones, and planer shavings cyclone baghouse are well below limitations listed under IDAPA 58.01.01.710.08. Therefore, no monitoring is required. Related calculation can be found in Appendix B of this memo.

6. INSIGNIFICANT ACTIVITIES

See Section 6 of the permit. The facility-wide permit conditions have covered the applicable requirements of these insignificant activities (e.g., opacity, reasonable fugitive control, sulfur content of oil, etc.). Listed below are the insignificant activities described by the source in accordance with IDAPA 58.01.01.317:

Description	Insignificant Activities IDAPA Citation Section 58.01.01.17.01.b.I
Sawmill	30
Sawmill Screen	30
Sawmill Chipper, Indoors	30
Planer Hog	30
Planer Chipper Screen (classifier), Indoors	30
Backup Fuel Storage Pile Cyclone	30
Pattern Shavings Cyclone	30
Chipper Fines Cyclone	30
Trimmer Sawdust Cyclone	30
Fire Water Pump with 150hp Diesel Motor	6
10hp Gas-fired Generator	6

The 02/09/2000 E-mail from C-P, CDA stated, "The equipment descriptions are too specific. If the insignificant sources were changed, this would require a modification of the Tier I permit. The fire water pump should not be assigned a motor size. The final item should read "small generators and compressors." Alternatively, the equipment list could be included in the Technical Analysis memo instead of the permit." This approach has been used.

7. COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION

7.1 COMPLIANCE PLAN

See General Provision 8.20 of the permit.

7.2 COMPLIANCE CERTIFICATION

See General Provision 8.21 of the permit.

8. REGISTRATION FEES

IDAPA 58.01.01.525 applies to this facility. C-P, CDA shall determine annual emissions in a manner consistent with IDAPA 58.01.01.525 for the purposes of registration fees. According to the Air Emissions Database Master List for 1999, C-P, CDA has registered 160.8 tons of pollutants by paying fees.

9. AIRS UPDATE

No change to AIRS, as there are no new emissions units added.

10. ACID RAIN PERMIT

This does not apply to this facility.

11. RECOMMENDATION

Based on the Tier I OP application and review of the federal regulations and state rules, the Technical Service Office recommends that DEQ issue a final Tier I OP for Crown Pacific Limited Partnership, Coeur d'Alene Operations.

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cc: DEQ State Office
 Coeur d'Alene Regional Office
 L. Kral, EPA Region X

APPENDIX A

Tier I OP

**Crown Pacific Limited Partnership
Coeur d'Alene Operation
Kipper and Sons Boiler Emission Source Test Summary**

SUMMARY OF RESULTS

Results of the air emission testing are summarized in Table 2, and 3. The results presented in Table 2 present the results for Front-half particulate matter, Condensable particulate matter (back-half), and Total particulate matter. Table 3 presents the results of Visible emissions, and Table 4 presents individual run data and averages. Supporting data is located in Appendixes A. Boiler operating parameters recorded during the testing can be found in Appendix B. Applicable nomenclature and sample calculations are included in Appendix. The source test plan and IDEQ letter of approval are included in Appendix D. Quality assurance information relevant to the performance testing can be found in Appendix E.

Table 2. Summary of Total Particulate Emissions

	Particulate Emissions			
	gr/dscf	gr/dscf @ 8% O ₂	lbs/hr	lb/Mlb steam
Particulate Matter Front-half:	0.0337	0.0292	5.11	0.10
Condensable Back-half:	0.0097	0.0084	1.47	0.03
Particulate Matter Total:	0.0434	0.0376	6.58	0.13

The IDEQ particulate emission standard is 0.20 gr/dscf corrected to 8% oxygen.

Table 3. Summary of Visible Emissions Emissions

Visible Emissions	
Number of Readings $\geq 20\%$ Opacity	0
Number of Minutes $\geq 20\%$ Opacity	0
Average of Readings $\geq 20\%$ Opacity	0

The IDEQ visible emission standard is $\geq 20\%$ opacity over three minutes in an hour..

Instrument Readings during Stack Test
Crown Pacific - Coeur d'Alene
Test Date: June 20, 2000

Run	Time	T/R 1 Voltage (kV)	T/R 1 Current (mA)	Steaming Rate (lb)	Steam Temp. (F)	Steam Pressure (psi)	Boiler Oxygen (%)	Pressure Drop Across Multiclone (iwc)
Run 1	8:47	41	90	53,000	570	125	2.7	N/A
	9:30	40.5	80	50,900	580	120	2.0	-2.9
Run 2	11:04	42	95	47,900	580	120	1.7	-3.0
Run 3	12:56	40	80	49,000	580	115	2.2	-3.1
	1:27	40	80	52,900	575	117	2.8	-3.0

T/R 2 was down. Readings made by Diane Lorenzen

APPENDIX B

Tier I OP

**Crown Pacific Limited Partnership
Coeur d'Alene Operation
Emissions Calculations for Process Equipment
(IDAPA 58.01.01.701 & 710)**

Crown Pacific, Coeur d'Alene Lumber Facility, Process Weight Calculations

PROCESS EQUIPMENT	THROUGHPUT Tons/yr	Tons/hr	PW(a) lb/hr	AE(b) from PW lb/hr	E(c) from source lb/hr	AE-E	E/AE(%)	AG (gr/scf, (f))	G(gr/scf, air (g))	G/AG %
Hogged fuel sales bin target box,	56,680	6.47	12941	11.73	0.65	11.09	6%			
sawdust bin target box,	47,040	5.37	10740	11.20	0.54	10.66	5%			
sawmill chip bin target box,	144,000	16.44	32877	14.81	1.64	13.17	11%	0.2	0.00	2%
planer chip bin target box,	24,000	2.74	5479	7.88	0.27	7.60	3%			
debarking,	800,000	91.32	182648	22.74	2.19	20.55	10%			
bark hog	56,680	6.47	12941	11.73	0.65	11.09	6%			
Boiler fuel storage cyclone,(e)		8	29091	14.37	1.60	12.77	11%	0.2	0.01	5%
Backup fuel storage pile cyclone		5	18182	12.77	1.00	11.77	8%	0.2	0.01	5%
boiler feed cyclone,		10	36364	15.19	2.00	13.19	13%	0.2	0.04	20%
shavings bin cyclone		6	14118	11.99	1.20	10.79	10%	0.2	0.01	5%
pattern shavings cyclone		2.5	5882	8.22	0.50	7.72	6%	0.2	0.01	4%
	mbdf/yr	mbf/hr								
Lumber drying kilns(i)	200,000	23.15	61350	17.31	7.64	9.67	44%			

note:

a) PW (lb/hr) = maximum annual throughput (tons/yr) * (2000 lb/Ton) / (8760 hrs/yr)

b) Allowable Emissions (AE)(lb/hr): using eq a or b under IDAPA 58.01.01.701 or 702

c) Emissions from process equipment(E) (lb/hr)= (Tons/yr) / (8760 hr/yr) * EF (lb/Ton)

d) EF

EF = 0.1 lb/Ton for target box	0.1
EF = 0.024 lb/Ton of logs for debarking	0.024
EF = 0.1 lb/Ton of bark hogged for bark hog	0.1
EF = 0.2 lb/BDT of bark, for cyclone exhaust, shavings and hogged	0.2
EF = 0.33 lb/mbf for dry kilns, IDEQ factor.	0.33

E/AE for IDAPA 58.01.01.710.08III = (0.2 lb/Ton) / ((1 lb/Ton, limit) * 100 = 20%

a) lb/hr = BDT (bonedry ton)/hr / (1-45%)	green	45%
	dried	15%

f) AG - allowable emissions concentration, from IDAPA 58.01.01.710.08.I, state only until approved by EPA to be part of SIP.

g) G (grains/scf, air) = E (lb/hr) * 7,000 gr/lb / (x scf/min*mo% of dry air) /60 (min/hr)

h) mo% of dry air 57.43%

annual average relative humidity (approximately equate to absolute humidity) in Coeur d'Alene 46%

	scf/min
sawmill chip bin target box	73042
Boiler fuel storage cyclone,(e)	30000
Backup fuel storage pile cyclone	22000
boiler feed cyclone,	10000
shavings bin cyclone	25000
pattern shavings cyclone	12000

no given data, proportioned with flowrate of boiler fuel storage cyclone by their throughputs.

i) More information can be found in the fax from Lorenzen Engineering, Inc. to Yihong on 1/7/00

based on rough green 2x4's 84.8 ft³/MBF

based on 75% interior Douglas fir and 25% western hemlock 40.9 lb/ft³ @45%

Crown Pacific, Coeur d'Alene Lumber Facility, Process Weight Calculations

Truck bins load out						
Process	PW(h) lb/hr	AE from PW e lb/hr	E(i) from source lb/hr	E(j) from source lb/hr	Ei/AE(%)	Ej/AE(%)
Hogged bark truck bin loadout	44000	20.09	3.19	17.60	16%	87.61%
sawdust bin truck loadout,	44000	20.09	1.40	17.60	7%	87.61%
sawmill chip+ planer chip bin truck loadout	42667	19.92	2.39	17.07	12%	85.67%
planer shavings bin truck loadout,	17333	15.62	2.57	13.87	16%	88.77%

note:

h) the process weight was provided by the applicant. it can be found in the public comment package.

1.5 hr is used as truck bin unloading time period per submittal.

i) EF per applicant fax dated 1/25/2000 and with permitting engineer's review.

$$E = k * 0.0032 * (U/5)^{(1.3)} / (M/2)^{(1.4)}$$

AP-42 Section 13.2.4.

k= 1 for PM

U: wind speed, using a maximum wind speed of 15 mph

M: assume the surface moisture is 45% for green wood and 15% for kiln dried wood. 30% for hogged bark

	M%	EF
hogged bark	25%	0.14
sawdust	45%	0.06
sawmill chip+ planer chip	30%	0.11
planer shavings	15%	0.30

j) EF taken from DEQ's June 30, 1997 memo

The sawmill chip, sawdust, and hogged bark contain 45% of moisture, and the planer chip is much bigger than sawdust, therefore, the 0.4 adjusting factor is used

the size of shaving (M% = 11%- 15%) is bigger than sanddust. adj. factor 0.8 is used

EForg = 2 lb/ton		
	adj. factor	EF * adj fac.
hogged bark	0.4	0.80
sawdust	0.4	0.80
sawmill chip	0.4	0.80
planer chip	0.4	0.80
planer shavings	0.8	1.60

APPENDIX C

Tier I OP

**Crown Pacific Limited Partnership
Coeur d'Alene Operation
Conversion Factors for the
Pacific Northwest Forest Industry**

Table E-6

Species	Moisture content (%O.D. wt. basis)																
	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
	pounds per actual cubic foot																
Coast Douglas-fir	32.0	32.5	32.9	33.4	33.9	34.3	34.8	35.2	35.6	36.0	36.4	37.2	38.1	38.9	39.8	40.6	41.4
Interior Douglas-fir	32.5	33.1	33.6	34.1	34.6	35.1	35.5	36.0	36.4	36.9	37.3	38.2	39.0	39.9	40.8	41.6	42.5
Western hemlock	29.9	30.4	30.8	31.3	31.7	32.1	32.5	32.9	33.3	33.7	34.1	34.8	35.6	36.4	37.2	38.0	38.8
Pacific silver fir	28.7	29.2	29.6	30.0	30.4	30.7	31.1	31.5	31.8	32.2	32.5	33.2	34.0	34.7	35.5	36.2	37.0
Ponderosa pine	25.5	26.0	26.4	26.9	27.4	27.8	28.2	28.7	29.1	29.5	29.9	30.6	31.3	32.0	32.7	33.3	34.0
Sitka spruce	26.1	26.5	27.0	27.4	27.8	28.2	28.6	28.9	29.3	29.7	30.0	30.7	31.4	32.1	32.8	33.5	34.2
Western white pine	25.5	25.9	26.3	26.7	27.1	27.5	27.9	28.2	28.6	28.9	29.2	29.9	30.6	31.3	31.9	32.6	33.3
Western redcedar	21.5	21.9	22.4	22.9	23.4	23.8	24.3	24.7	25.1	25.6	26.0	26.6	27.2	27.8	28.4	29.0	29.6
Red alder	26.4	26.8	27.2	27.6	28.0	28.4	28.7	29.0	29.4	29.7	30.0	30.7	31.4	32.1	32.8	33.5	34.2

Species	Moisture content (%O.D. wt. basis)																
	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96	99
	pounds per actual cubic foot																
Coast Douglas-fir	42.3	43.1	44.0	44.8	45.6	46.5	47.3	48.2	49.0	49.8	50.7	51.5	52.4	53.2	54.0	54.9	55.7
Interior Douglas-fir	43.3	44.2	45.1	45.9	46.8	47.6	48.5	49.4	50.2	51.1	51.9	52.8	53.7	54.5	55.4	56.3	57.1
Western hemlock	39.6	40.3	41.1	41.9	42.7	43.5	44.3	45.1	45.8	46.6	47.4	48.2	49.0	49.8	50.6	51.4	52.1
Pacific silver fir	37.7	38.5	39.2	40.0	40.7	41.5	42.2	43.0	43.8	44.5	45.2	46.0	46.7	47.5	48.2	49.0	49.7
Ponderosa pine	34.7	35.4	36.1	36.8	37.5	38.2	38.9	39.6	40.2	40.9	41.6	42.3	43.0	43.7	44.4	45.1	45.8
Sitka spruce	34.9	35.6	36.3	37.0	37.7	38.3	39.0	39.7	40.4	41.1	41.8	42.5	43.2	43.9	44.6	45.3	46.0
Western white pine	34.0	34.6	35.3	36.0	36.7	37.3	38.0	38.7	39.4	40.0	40.7	41.4	42.1	42.7	43.4	44.1	44.8
Western redcedar	30.2	30.8	31.4	32.0	32.6	33.2	33.8	34.4	35.0	35.6	36.2	36.8	37.4	38.0	38.6	39.2	39.8
Red alder	34.9	35.6	36.3	37.0	37.7	38.3	39.0	39.7	40.4	41.1	41.8	42.5	43.2	43.9	44.6	45.3	46.0

Interior Douglas-fir refers to Douglas-fir found in California and all counties in Oregon and Washington east of but adjacent to the Cascade Summit.
Source: Calculated by the authors using densities from table E-1 and shrinkage factors from table F-1.

Table II-3

Cubic foot contents of sawn domestic lumber

Nominal lumber sizes	Rough green Assumed* cubic content		Surfaced green Actual** cubic content		Surfaced dry Actual** cubic content	
	per linear foot	per MBF	per linear foot	per MBF	per linear foot	per MBF
cubic feet of sawn lumber						
2 x 2	0.0198	59.4	0.0170	51.0	0.0156	46.8
2 x 3	0.0315	63.0	0.0278	55.6	0.0260	52.0
2 x 4	0.0432	64.8	0.0387	58.1	0.0365	54.8
2 x 6	0.0667	66.7	0.0604	60.4	0.0573	57.3
2 x 8	0.0894	67.1	0.0814	61.1	0.0755	56.6
2 x 10	0.1128	67.7	0.1031	61.9	0.0964	57.8
2 x 12	0.1362	68.1	0.1248	62.4	0.1172	58.6
3 x 6	0.1061	70.7	0.0990	66.0	0.0955	63.7
3 x 8	0.1423	71.2	0.1335	66.8	0.1259	62.9
3 x 10	0.1796	71.8	0.1691	67.6	0.1606	64.2
3 x 12	0.2170	72.3	0.2046	68.2	0.1953	65.1
3 x 14	0.2543	72.7	0.2402	68.6	0.2300	65.7
4 x 4	0.0944	70.8	0.0881	66.1	0.0851	63.8
4 x 6	0.1456	72.8	0.1376	68.8	0.1337	66.9
6 x 6	0.2246	74.9	0.2149	71.6	0.2101	70.0
6 x 8	0.3012	75.3	0.2897	72.4	0.2769	69.2
8 x 8	0.4038	75.7	0.3906	73.2	0.3650	68.4
8 x 10	0.5097	76.5	0.4948	74.2	0.4657	69.9
10 x 10	0.6433	77.2	0.6267	75.2	0.5942	71.3
10 x 12	0.7770	77.7	0.7587	75.9	0.7227	72.3
12 x 12	0.9385	78.2	0.9184	76.5	0.8789	73.2
12 x 14	1.0999	78.6	1.0781	77.0	1.0352	73.9
14 x 14	1.2892	78.9	1.2656	75.5	1.2192	74.6

*Dimensions assumed to be 1/8 in. over surfaced, green.

**See table II-2 for actual dimensions.

Source: Calculated by the authors.

APPENDIX D

Tier I OP

**Crown Pacific Limited Partnership
Coeur d'Alene Operation
EPA's Letter on OCEM**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

RECEIVED

OCT 27 2000

DEPT. OF ENVIRONMENTAL QUALITY
TECHNICAL SERVICES OFFICE

Reply To
Attn Of: OAQ-107

OCT 25 2000

K.C. Hansen
Crown Pacific Limited Partnership
P.O. Box 729
Coeur d'Alene, ID 83816

Re: Crown Pacific Limited Partnership
Coeur d'Alene, Idaho Operations

Dear Mr. Hansen:

This letter is in response to your May 8, 2000, request to discontinue the operation of the continuous opacity monitoring system (COMS) on the hogged fuel boiler in operation at Crown Pacific Limited Partnership (Crown Pacific) operation in Huetter, Idaho. On August 30, 2000, Kory Tonouchi, of my staff, requested Crown Pacific to submit historical opacity records demonstrating that the hogged fuel boiler is in compliance with the opacity limits.

We understand that the COMS was originally installed to measure particulate emissions from the hogged fuel boiler in 1992. At that time, particulate emissions from the boiler were controlled only by a multiclone. The reasons why the COMS was required to be installed were to ensure that the boiler was meeting the visible emission limit at all times and to assist plant personnel in operating the boiler efficiently and in compliance with the regulations.

Subsequent to the installation of the COMS, an electrostatic precipitator (ESP) was installed on the boiler downstream from the multiclone. According to your letter, the installation of the ESP resulted in the control of particulate emissions and opacity to levels well below the regulatory limits. A review of the information that you submitted confirms that the boiler has operated in compliance with the regulatory limits.

EPA Region 10 hereby approves the discontinued use of the COMS on the hogged fuel boiler. However, this approval is conditioned upon Crown Pacific having adequate parametric monitoring requirements for the boiler and ESP in the facility's Title V Operating Permit. Such monitoring should include the ESP's primary and secondary current and voltage and the spark rate to be monitored on an hourly basis. Additionally, Crown Pacific should perform an EPA Reference Method 9 visible emission observation monthly during operation of the boiler. We

understand that you and your consultant, Diane Lorenzen of Lorenzen Engineering, agree with the suggested monitoring parameters. We also understand that the Idaho Department of Environmental Quality will be incorporating those parameters in the facility's Title V Operating Permit.

Crown Pacific should be aware that if excess particulate and visible emissions become an issue in the future, this decision will have to be reconsidered. If you have any questions regarding this approval, please contact Mr. Tonouchi at (206) 553-6908.

Sincerely,



Barbara McAllister, Director
Office of Air Quality

cc: Thomas Harman, IDEQ-Coeur d'Alene
Yihong Chen, IDEQ-HQ
Jim Greaves, EPA-IOO/A